

HP 8753A

RF Network Analyzer

300 kHz to 3 GHz



Fast and cost-effective RF network measurements
with outstanding performance

Technical Data



An Easy-to-Use Measurement System

Large Annotated Display

View measured data, softkey selections, and measurement annotations easily on this large 23 cm (9") digital display.

Softkey Operation

Softkey selections guide the operator easily through measurements. Selections are accessed quickly from the function keyboard, each key providing a different set of related measurement functions.

Two Independent Channels

Measure transmission and reflection characteristics simultaneously with two independent measurement channels.

Easy Three Step Operation

Quickly make basic measurements by using only these three selections.

Data Entry

Data entry for all functions is quickly accomplished with the knob, step keys or key pad.

Copy

Direct hard copy output to an HP-IB plotter or printer.

Save/Recall

Save and/or recall measured data, calibration data and instrument states.

Local

Provides HP-IB addressing and system controller selections.

System

Provides limit testing, service functions and other system information.

3 Input Receiver

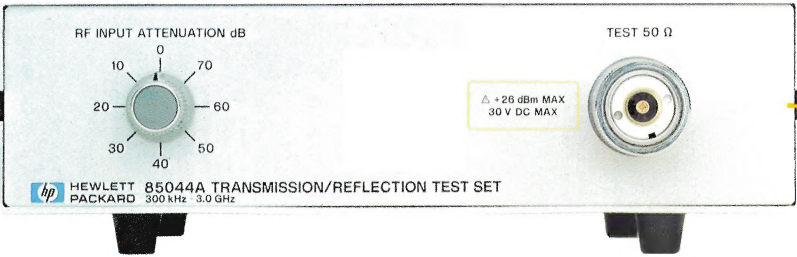
Three tuned receivers allow versatility of either independent power measurements or simultaneous ratio measurements of reflection and transmission over a large 100 dB of dynamic range.

Full Measurement Solutions for 50 and 75 Ohm Environments

S-parameter test sets, one path transmission/reflection test sets, and a full line of calibration/verification kits and adapters combine to provide complete measurement solutions in both 50 and 75 ohm impedances.

Built-in Swept Synthesized Source

A built-in synthesized 300 kHz to 3 GHz source with 1 Hz resolution adds convenience and performance to swept measurements. Stimulus keys directly control frequency with the menu key providing additional source functions.



Designed for Productivity and Versatility

Your Choice in Measurement Formats and Configurations

Display both the magnitude and the phase response of test devices for complete linear characterization in either reflection or transmission configurations. Measure the device's reflection coefficient, Return Loss, SWR or impedance when configured with a signal separation device. Characterize the insertion loss, insertion phase, gain, gain compression, isolation, group delay, or the deviation from linear phase performance of the test device in a transmission configuration.

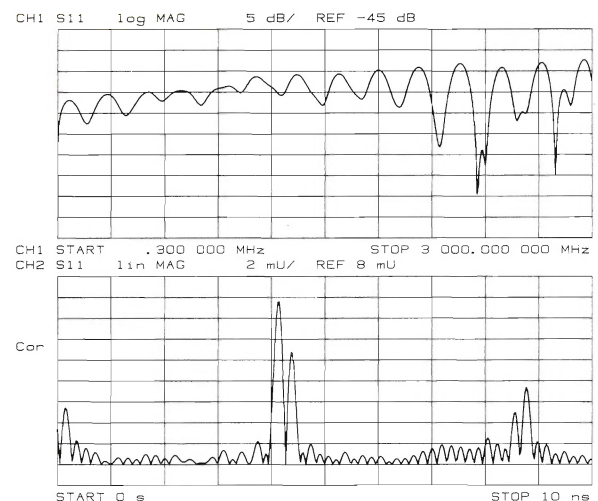
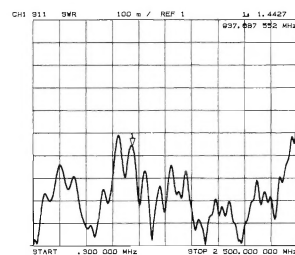
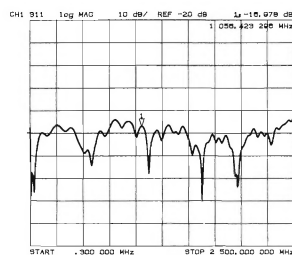
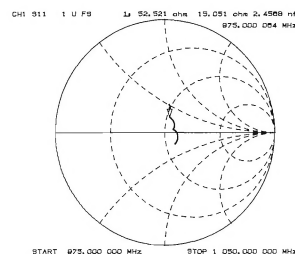
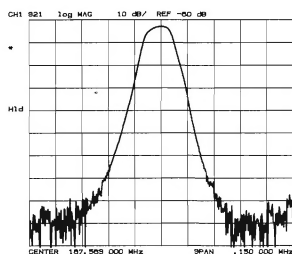
Performance You Need for those Critical Applications

Measure your devices with a synthesized 1 Hz frequency resolution, 0.001 dB magnitude and 0.01 degree phase resolution, and 100 dB of measurement range over the entire 300 kHz to 3 GHz frequency range. Internal accuracy enhancement routines remove frequency response errors and systematic test system errors to provide the highest measurement accuracy possible.



Both Frequency and Time-Domain Analysis

Gain more insight into the behavior of your devices, such as locating the magnitude and location of discontinuities in transmission lines, or measure the individual transmission paths of signals as a function of time. The HP 8753A with its optional time-domain capability can display the time-domain response of a network by computing the Fourier Transform of the frequency-domain response. Make either traditional Time-Domain Reflectometer (TDR) measurements on broadband devices such as cables, or frequency selective time-domain measurements on devices such as Surface Acoustic Wave (SAW) filters or antennas.

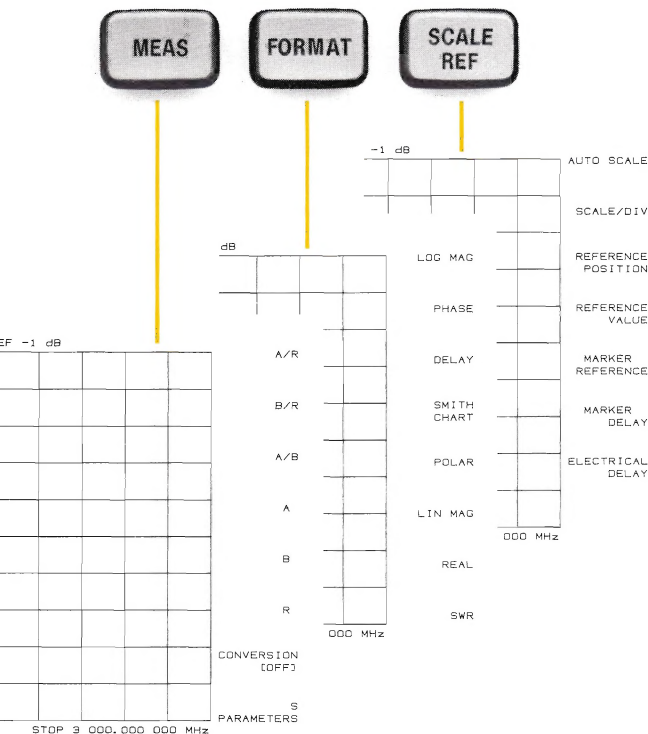


Automated Measurements Without a Computer

Easy Three Step Operation

Quickly select your set-up and make measurements through a three step sequence. Once you have selected the frequency range, use only these three keys to access all of the functions you need to make your basic measurements:

- 1) **Meas**—Select the input ports for your transmission or reflection measurement. For example, “B/R” is a transmission measurement when you’re using a test set.
- 2) **Format**—Select the data you want (magnitude, phase, or delay) and display it in a logarithmic, linear, polar, real, Smith Chart or SWR format.
- 3) **Scale**—Scale and position measurements on the display for easy viewing by selecting the AUTOSCALE function or by defining your own scale, reference value, or reference position.



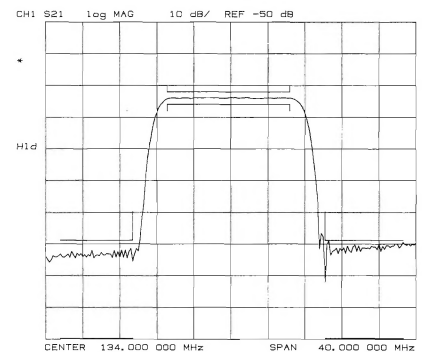
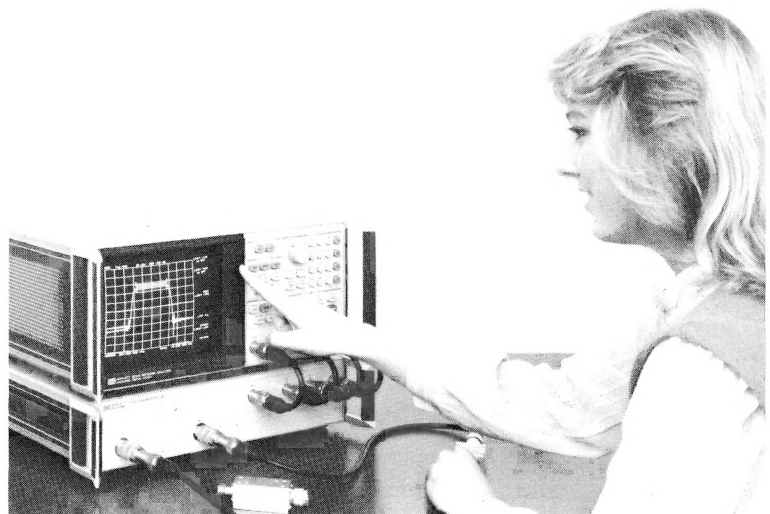
Save/Recall Test Setups

Saving instrument test configurations including limit values, arbitrary frequency lists and calibration data in internal memory of the HP 8753A means a quick return of your instrument to the exact same measurement configuration.



Go/No Go Testing

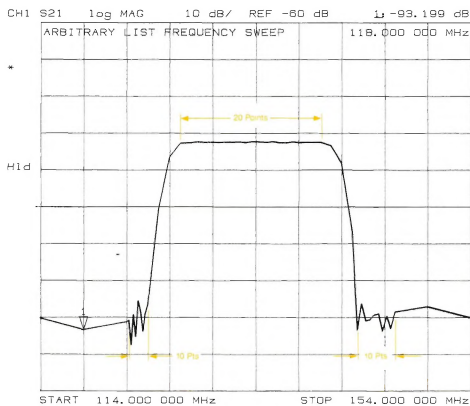
Reduce test times by letting the network analyzer make the decision of whether or not your device under test has passed. Define single point limits, horizontal lines or sloping lines from the front panel of the HP 8753A. Pass/fail indication for either measurement channel can be determined on the display, over the Hewlett-Packard Interface Bus (HP-IB*), or from a rear panel TTL output.



*HP-IB is Hewlett-Packard's hardware, software documentation, and support for IEEE-488 and IEC-625, worldwide standards for interfacing instruments.

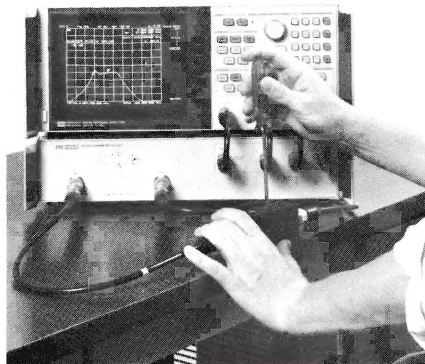
Arbitrary Frequency Testing

Speed up your testing by measuring your devices at only the frequencies you select. From the front panel of the HP 8753A, define from 1 to 30 arbitrary CW frequencies or frequency sweep segments at which you wish to measure your device. Measurement occurs at only those frequencies (or frequency segments) you select, reducing your test times and increasing your measurement throughput.



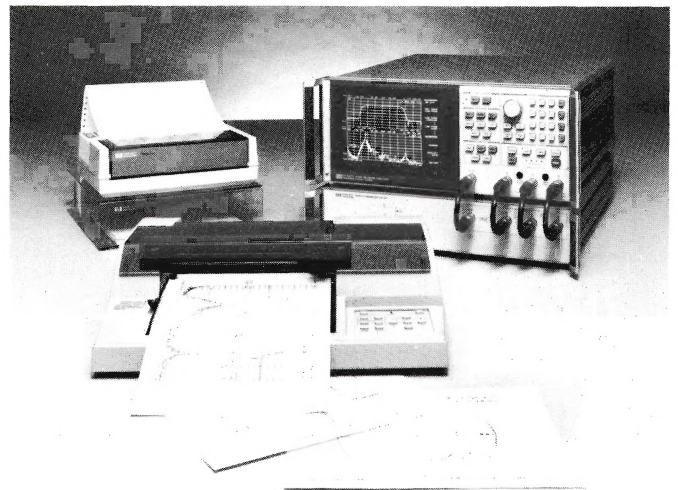
Marker Track Functions Aid Adjustments

Minimize your adjustment time with markers that automatically track the maximum, minimum, or a defined value of the data trace. These markers provide you with the fast, updated magnitude and frequency information during your device adjustment sequence.



Document Measured Data Quickly and Easily

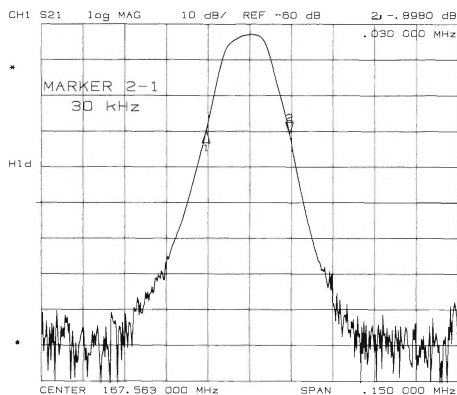
Obtain annotated hard copies of measured data quickly on compatible Hewlett-Packard Graphics Language plotters and printers. The HP 8753A can directly output data to these digital plotters and printers without the use of external computers. Titles and other information can be easily added from the front panel of the HP 8753A to customize your display, plots and data lists.



Maximum Versatility and Capability for Demanding Applications

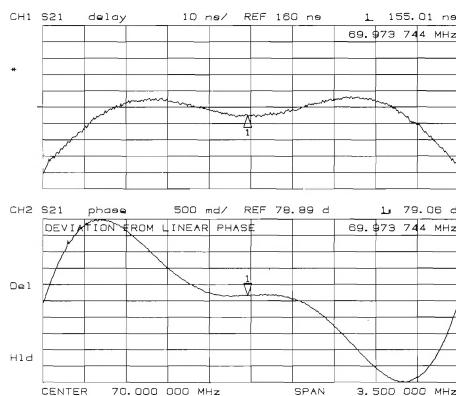
Narrowband Device Measurements

Reflection and transmission measurements of narrowband devices such as resonators require high resolution and stable frequency sources. The HP 8753A's built-in synthesized frequency source with 1 Hz settability and display resolution eliminates the need for any additional special test equipment in these measurements.



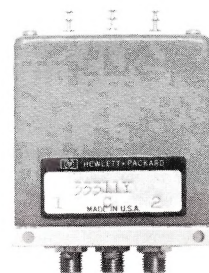
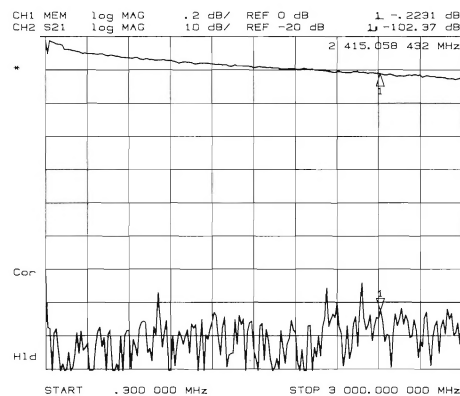
Filter Distortion Measurements

Make high-resolution measurements of group delay or deviation from linear phase in addition to wide range reflection and transmission measurements. A built-in electronic line stretcher function adds the appropriate amount of electrical length necessary to normalize phase data resulting in high resolution measurements of deviation from linear phase.



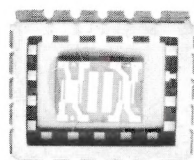
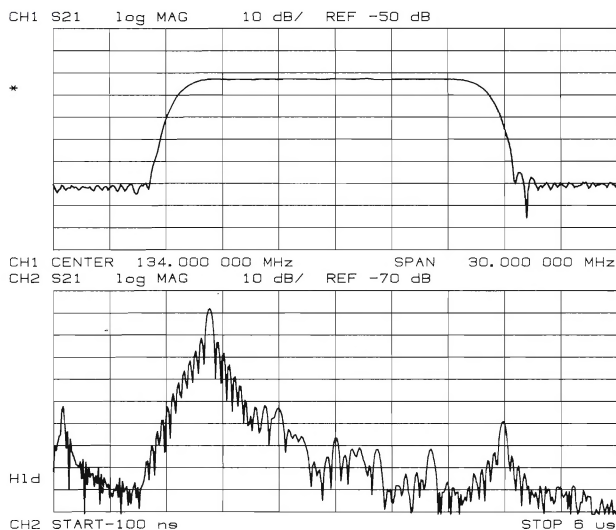
Wide Range RF Switch Measurements

Large isolation and accurate low loss insertion measurements place different demands on a network analyzer. The HP 8753A can measure better than 100 dB of isolation when the switch "under-test" is open and measure the low loss insertion path to 0.001 dB resolution with the switch closed.



Saw Device Measurements

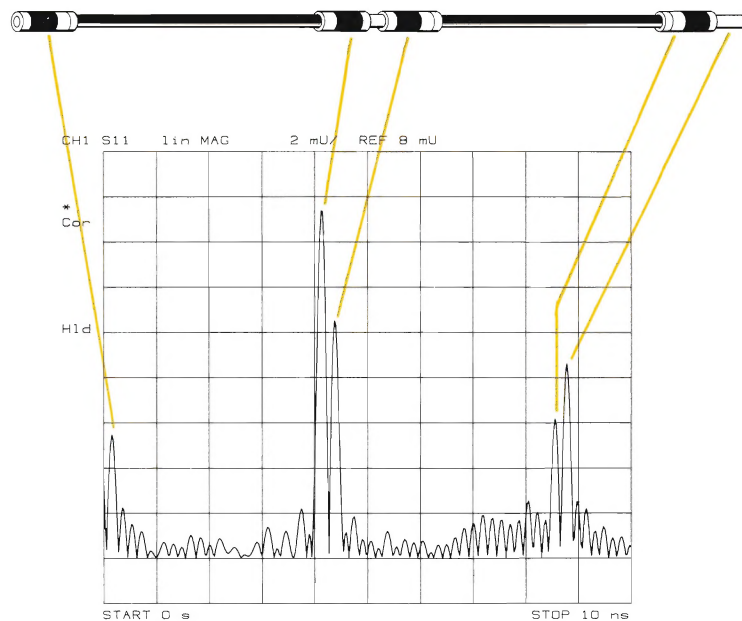
Completely characterize SAW (Surface Acoustic Wave) devices with high resolution return loss, insertion loss and group delay measurements. Measure passband ripple with 0.001 dB magnitude resolution and 0.1 picosecond delay resolution. Directly measure the SAW device's spurious time responses, such as RF feedthrough and triple transit with the HP 8753A's optional time-domain capability. Apply gating (a time-domain time selective filter) to the main lobe response and view the device's response independent of matching networks and connectors.



Versatile RF Cable Measurements

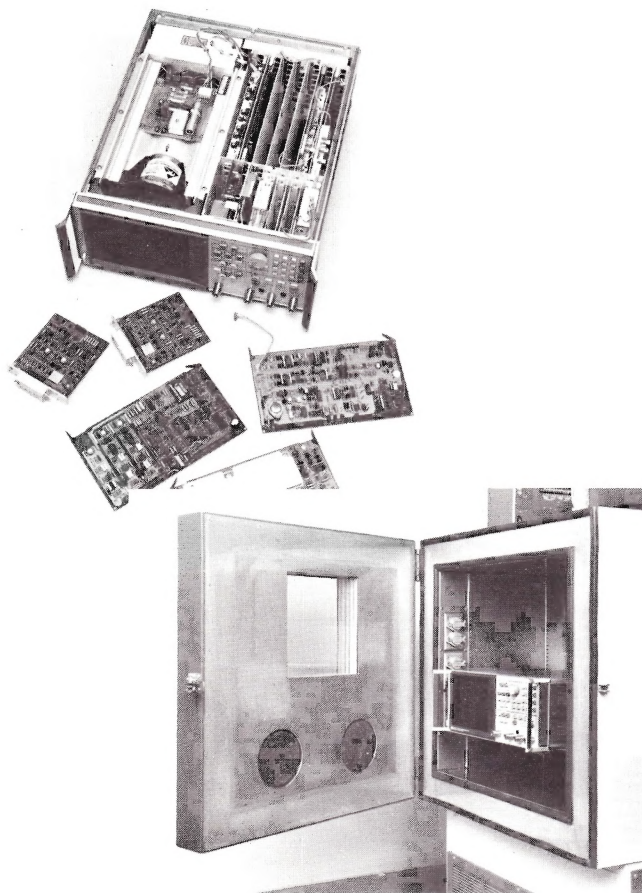
RF cable measurements such as return loss, insertion loss and cable delay are made easily with the HP 8753A's synthesized source and high resolution receivers. In addition, locate cable faults quickly and easily with the HP 8753A's optional time domain capabilities. Time-Domain allows you to resolve two closely located faults that are within 6 cm of each other.

Transmission Line Testing



Reliability Designed In

Reliability, one of the HP 8753A's major design goals, was proven through extensive environmental testing of shock, vibration and extreme temperature cycling. Built-in functional indicators such as "self test" and "operator checks" will detect any faults before invalid measurements can be made. Troubleshooting diagnostics will help you isolate the failure to one of eighteen modular assemblies, each of which can simply be replaced and aligned quickly. Your system can be back in operation in only a matter of hours, not weeks.



Minimal Maintenance Requirements

Since periodic maintenance can mean "down time" to you, the HP 8753A has been designed to minimize the frequency and the duration of required maintenance. A fast and easy 6 month system verification confirms that the HP 8753A along with its test set is working properly. Major alignments and adjustments need only be made once a year and can be performed with surprisingly little time or test equipment.

HP Systems Support

HP support products provided by local, qualified HP Customer Engineers are available to help get your HP 8753A measurement system operating quickly and properly:

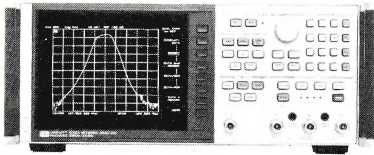
- On site installation and system verification — your system can be installed and certified at your location.
- On site system verification — system level verification resulting in a "Certificate of Traceability" and data traceable to NBS.
- On-site service — on site repair including two system verifications.
- Extend HP support period — adds two additional years of return-to-HP support.



Configure a Measurement System

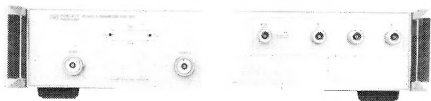
A complete measurement system consists of the network analyzer, a test set or splitter, a calibration kit (used with the test set), and test port extension cables to connect to the device under test.

1) Network Analyzer



2) Test Sets and Splitters

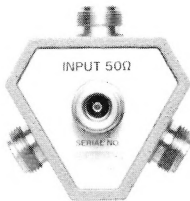
Separates the incident signal from the reflected or transmitted signals for ratio measurements with the network analyzer.



HP 85046A—50 ohm s-parameter
HP 85046B—75 ohm s-parameter



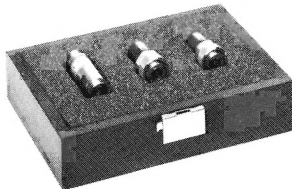
HP 85044A—50 ohm transmission/reflection
HP 85044B—75 ohm transmission/reflection



HP 11850C—50 ohm 3-way power splitter
HP 11850D—75 ohm 3-way power splitter

3) Calibration Kits

A complete line of calibration kits, available in 7 mm, type N (50 and 75 ohm), and 3.5 mm connectors, make calibrating a measurement system fast and easy.



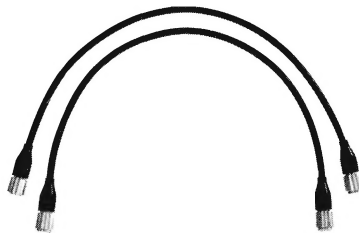
HP 85031B—7 mm
HP 85032B—50 ohm type N
HP 85033CB—3.5 mm
HP 85036B—75 ohm type N

4) Test Port Cables

High quality cables provide reliable connections between the test set and the device under test.



HP 11851B RF cable kit



HP 11857B—75 ohm test port return cables
HP 11857D—50 ohm 7mm test port return cables

5) Additional Accessories

Accessories such as verification kits, adapters, transistor test fixtures and support products such as extended return-to-HP support or on-site service are available to complement your measurement solution.

Typical Solution Configuration

	Measurement Application		
	Transmission Only	One-Path Reflection/Transmission	S-parameter
HP 8753A	X	X	X
HP 85044A/B		X	
HP 85046A/B			X
HP 11850C/D	X		
HP 11857B/D			X
HP 11851B	X	X	
Cal Kit*		X	X

*Calibration kit for the connector environment you need

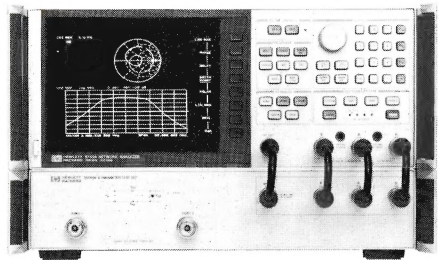
For more assistance in configuring and ordering an HP 8753A measurement solution—please refer to the HP 8753A Ordering Guide.

System Performance Summary

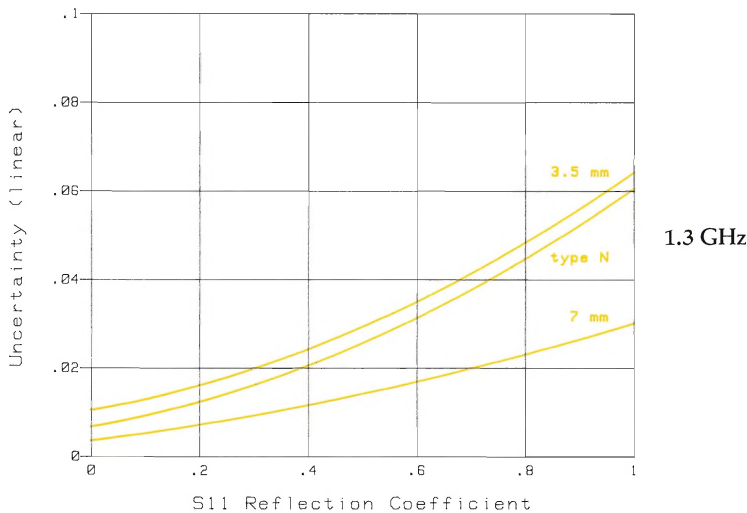
Specifications describe the instrument's warranted performance over the temperature range of 0 degrees C to 55 degrees C (except where noted). **Supplemental characteristics** are intended to provide information useful in applying the instrument by giving non-warranted performance parameters. These are denoted as "typical," "nominal," or "approximate."

Typical Measurement Uncertainty

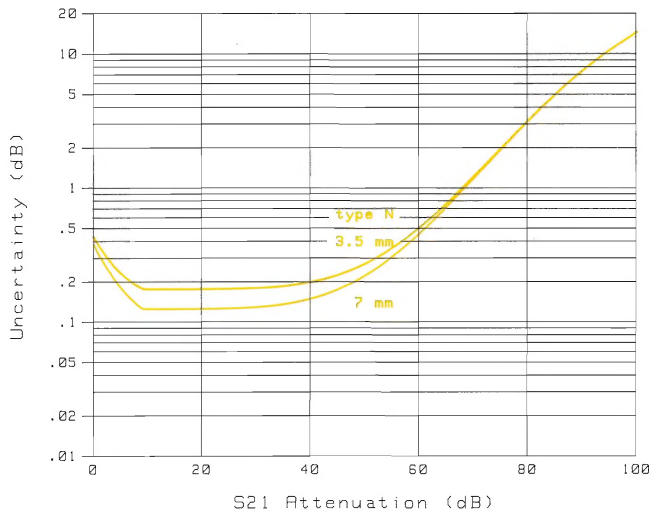
The following curves show the typical measurement uncertainty for different connector types when using the HP 8753A with the HP 85046A s-parameter test set after Accuracy Enhancement! Similar performance can be obtained with an HP 85044A transmission/reflection test set. Performance in 75 ohm type N (with the HP 85044B and the HP 85046B test sets) is similar to that of 50 ohm type N systems. The graph shown for reflection uncertainty applies to either a one port device or a two port device with more than 6 dB of insertion loss. Actual measurement uncertainties depend upon connector repeatabilities and characteristics of the device under test. These measurement uncertainty curves utilize an RSS model for the contributions of random errors such as noise, test set switch and typical connector repeatabilities, and a worst case model for the contributions of dynamic accuracy and residual systematic errors.



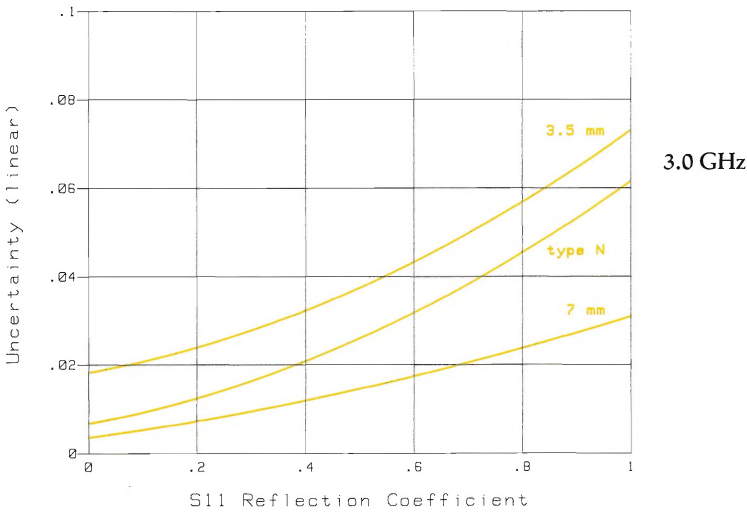
Reflection



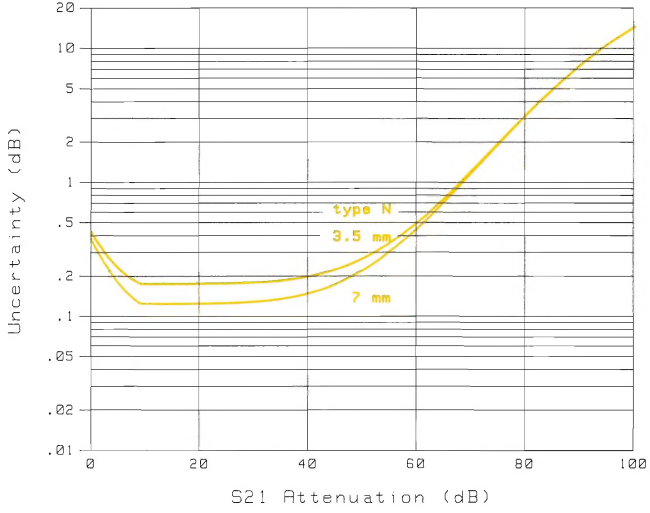
Transmission



Reflection



Transmission



Measurement Port Characteristics²

Residual Error	before accuracy enhancement (1.3/3.0 GHz)		after accuracy enhancement (1.3/3.0 GHz)			
	7 mm, 3.5 mm, type N		7 mm	type N	3.5 mm	
Directivity	35/30	dB	50	dB	44	dB
Source Match	20/16	dB	40	dB	30	dB
Load Match	20/16	dB	40	dB	30	dB
Frequency Response ³						
Reflection	±1.0	dB	±.05	dB	±.10	dB
Transmission	±1.0	dB	±.03	dB	±.08	dB
Crosstalk	90	dB	100	dB	100	dB
Dynamic Range	50 ohm systems		75 ohm systems			
	100 dB		90 dB			

¹Accuracy Enhancement is the calibration process of reducing systematic residual errors by characterizing those errors through the measurement of known standards, thereby minimizing their effects on actual measurements.

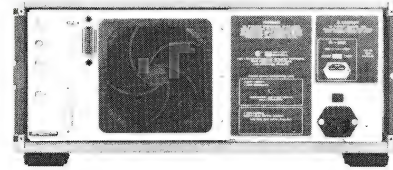
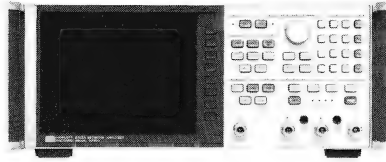
²For a full two port calibration with an IF BW of 10 Hz. For 7mm devices, accuracy enhancement is achieved using the HP 85031B 7mm calibration kit. For type N devices, accuracy enhancement is achieved using the HP 85032B 50 ohm type N calibration kit. For 3.5 mm devices, accuracy enhancement is achieved using the HP 85033C calibration kit. Environment temperature is 23 ± 3 degrees C.

³Frequency response errors can be reduced independently through a Frequency Response calibration.

Network Analyzer Specifications

(See definition of specifications and supplemental characteristics on page 14)

Specifications apply after a warm up period of one hour except as noted otherwise.



Source Characteristics

Frequency Characteristics

Range: 300 kHz to 3 GHz

Resolution: 1 Hz

Stability: typically ± 7.5 ppm 0 to 55°C
typically ± 3 ppm/year

Accuracy: 10 ppm @ 25°C $\pm 5^\circ$

Output Characteristics

Power Range: -5 to +20 dBm

Resolution: .1 dB

Flatness: ± 1 dB

Level Accuracy: $\pm .5$ dB @ 50 MHz, +10 dBm output power

Level Linearity: (-5 dBm to +15 dBm) $\pm .2$ dB @
(+15 dBm to +20 dBm) $\pm .5$ dB @ 25°C $\pm 5^\circ$ relative to +10 dBm
output level

Impedance: 50 ohms; Typically >16 dB RL (<1.38 SWR)

Connector: 50 ohm type N (f)

Spectral Purity: (With 0 to -10 dBm into R input)

Harmonics: < -25 dBc @ +20 dBm

Typically < -50 dBc @ 0 dBm

Nonharmonic Spurious:

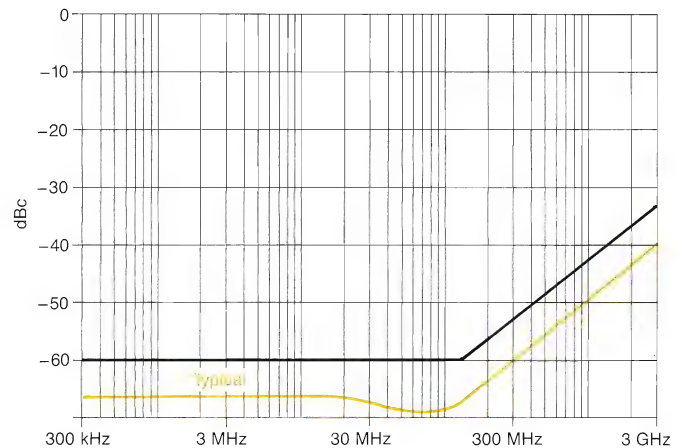
Mixers Related: < -32 dBc @ +20 dBm

Typically < -55 dBc @ 0 dBm

Other Spurious:

$f \geq 135$ MHz: -60 dBc + 20*log (f/135 MHz)

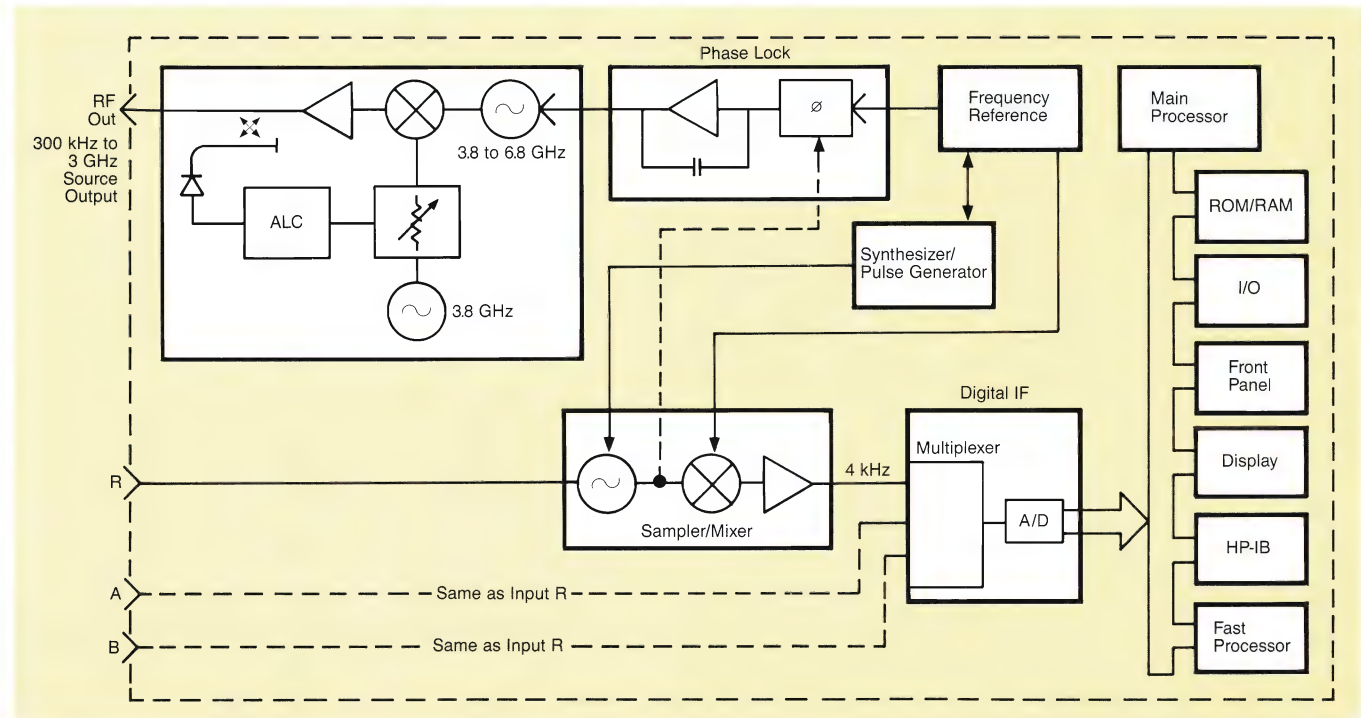
$f < 135$ MHz: -60 dBc



Phase Noise: (@ 10 kHz offset in 1 Hz BW)

$f < 135$ MHz, -90 dBc

$f \geq 135$ MHz, -90 dBc + 20*log (f/135 MHz)



HP 8753A Block Diagram

Receiver Characteristics

Input Characteristics

Frequency Range: 300 kHz to 3 GHz

Inputs: A, B 100 dB dynamic range

R 35 dB dynamic range

Noise Level (A, B): -90 dBm (3 kHz BW)

-100 dBm (10 Hz BW)

Typically -110 dBm (10 Hz BW)

Minimum R Level: -35 dBm (required for source operation)

Max Input Level: 0 dBm

Damage Level: +20 dBm or >25 VDC

Impedance: 50 ohms; >20 dB RL 300 kHz to 2 MHz

>23 dB RL 2 MHz to 2 GHz

>20 dB RL 2 GHz to 3 GHz

Connector: 50 ohm type N (f)

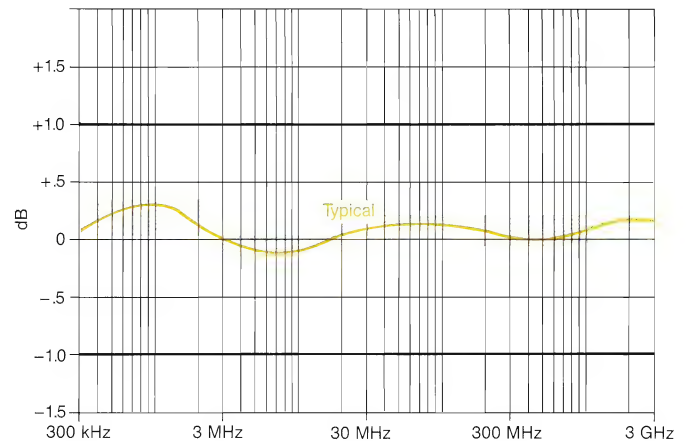
Input Crosstalk: -100 dB 300 KHz to 1 GHz

-90 dB to 3 GHz

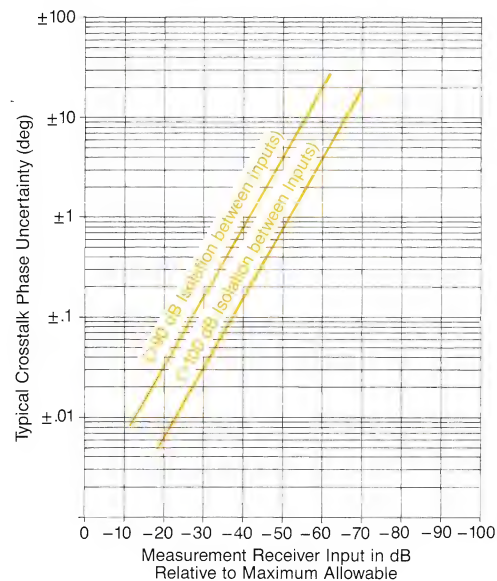
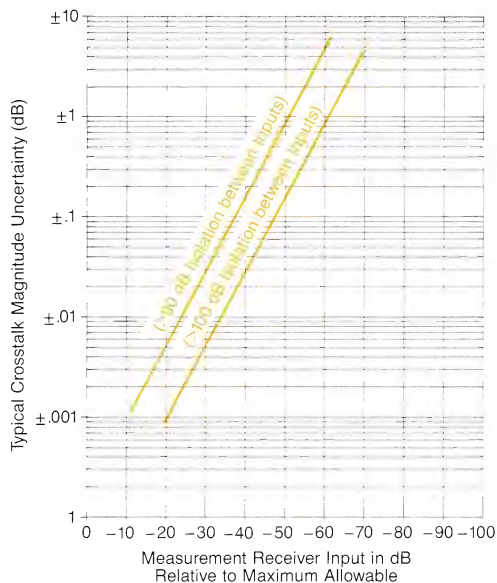
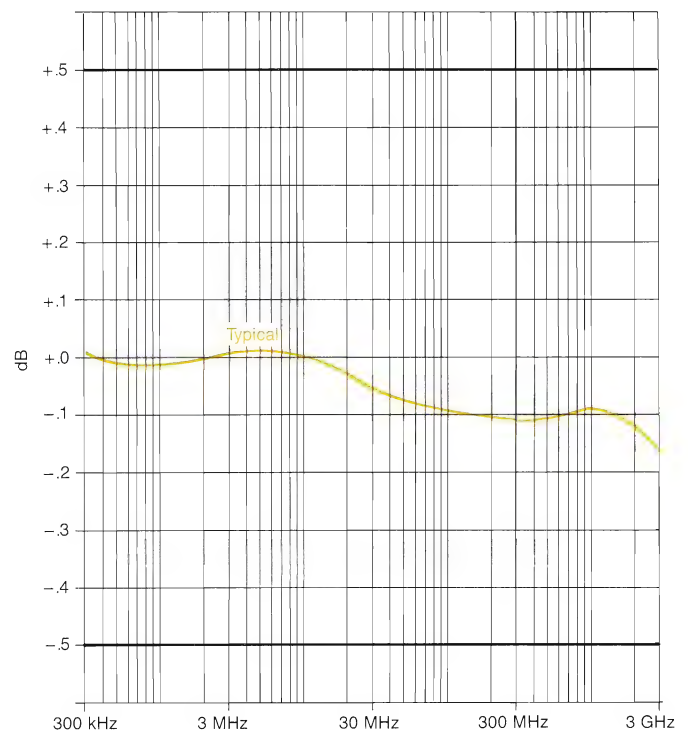
Source Crosstalk: typically <-135 dB

Magnitude Characteristics

Absolute Amplitude Accuracy (A,B,R) (-10 dBm , $25^\circ \pm 5^\circ\text{C}$):
 $\pm 1.0 \text{ dB}$



Ratio Accuracy⁴ (A/R, B/R, A/B): $\pm 0.5 \text{ dB}$ @ $25 \pm 5^\circ\text{C}$ with
 -10 dBm on all inputs



⁴unnormalized

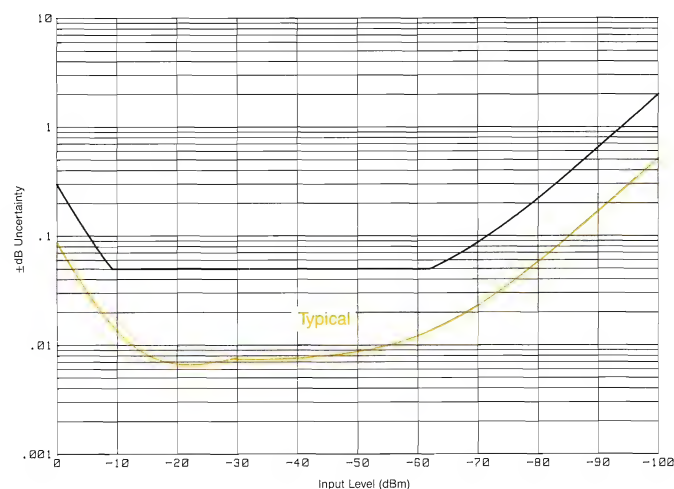
Network Analyzer Specifications (Cont'd.)

(See definition of specifications and supplemental characteristics on page 14)

Display Resolution: .01 dB/div

Marker Resolution:⁴ .001 dB

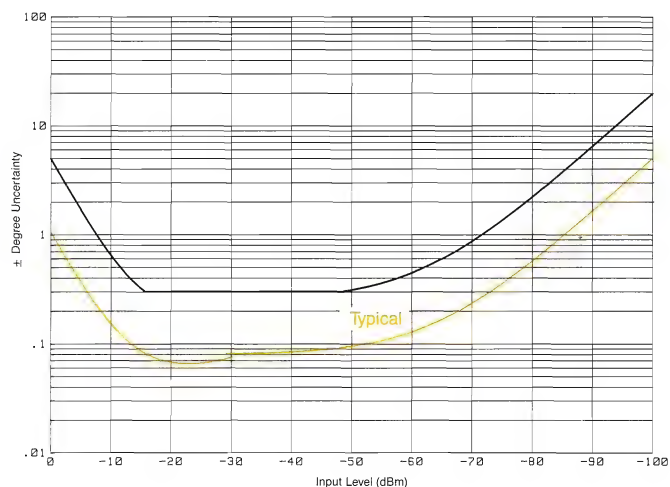
Dynamic Accuracy:



Display Resolution: .1°/div

Marker Resolution: .01°

Dynamic Accuracy:



Trace Noise: (-10 dBm, 3 kHz BW; A/R, B/R, A/B): <.005 dB rms

Reference Level: range: ±500 dB

resolution: .001 dB

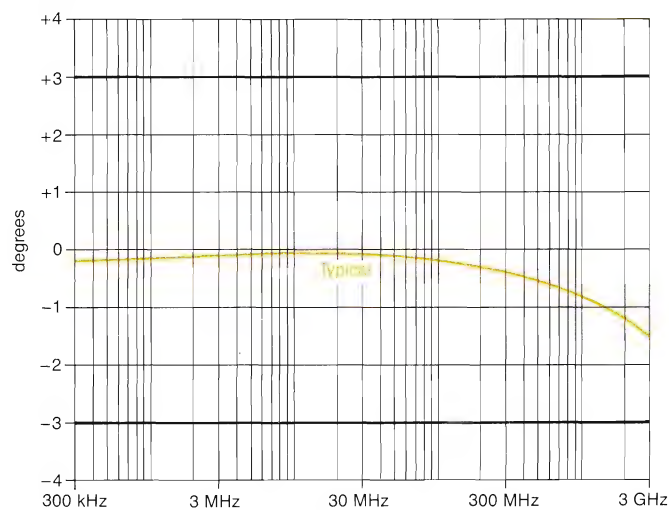
Stability: .01 dB/°C typically

⁴Marker resolution is dependent upon the value measured; resolution is limited to five digits.

Phase Characteristics (A/R, B/R, A/B)

Range: ±180 degrees

Frequency Response (deviation from linear): ±3°



Trace Noise: (-10 dBm, 3 kHz BW): $<.03^\circ$ rms

Reference Level: range ± 500 degrees
resolution .01 degrees

Stability: $0.05^\circ/\text{C}$ typically

Crosstalk: Specified under Input Characteristics

Polar Characteristics (A/R, B/R, A/B)

Range: 10×10^{-12} to 1000 units full scale

Reference Level: range of ± 500 units

Delay Characteristics

(Group delay is calculated directly from phase)

Range: $\frac{1}{2} \times (1/\text{minimum aperture})$, this corresponds to 180 degrees of phase between two adjacent points. For example, with a minimum aperture of 100 kHz, the maximum delay that can be measured is $5.0 \mu\text{sec}$.

Aperture: selectable (freq span)/(#points-1) to 20% of the freq span.

Accuracy: (phase accuracy ($^\circ$))/($360 \times \text{aperture (Hz)}$)

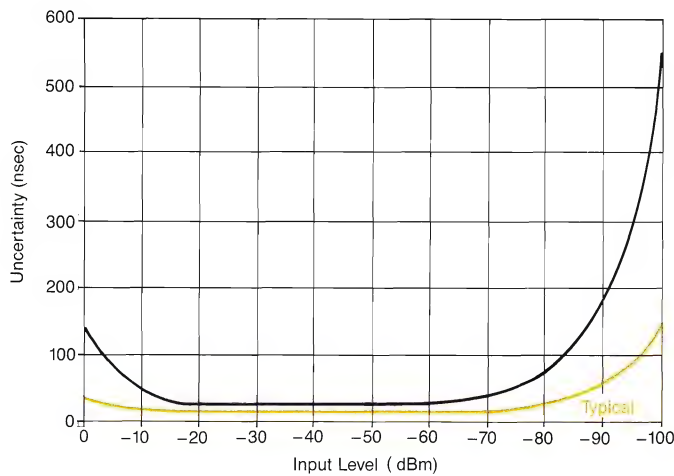
Resolution: 100 fs

$27.8/(\text{Aperture kHz}) \text{ nsec}$

Measurement Repeatability:

(phase repeatability)/($360 \times \text{aperture (Hz)}$)

Dynamic Accuracy:



Supplemental Characteristics

(See definition of specifications and supplemental characteristics on page 14)

Measurement

Number of Display Channels:

Two display channels available

Measurement Parameters:

A, B, R, A/R, B/R, A/B,

(labeled S-parameters, conversion to impedance or admittance)

Domains Available:

Frequency, Time⁵

Formats:

Cartesian: log/linear magnitude, phase, group delay, SWR, real part of complex parameters.

Smith Chart: with log/linear amplitude, $R + jX$, or $G + jB$ markers.

Polar: with linear/log amplitude, phase, or real and imaginary markers.

Data Markers:

Each display channel has four independent markers. Markers can indicate data at actual data points or they can interpolate between data points to allow the setting of a marker at an exact frequency. Any one of the four markers can be the reference marker for delta marker operation. Markers can be coupled or uncoupled between display channels.

Marker Functions:

Markers can be used in various functions; Marker search (MKR to max, MKR to min, MKR to target), Mkr bandwidth, Mkr \Rightarrow Start, Mkr \Rightarrow Stop, Mkr \Rightarrow Center, Mkr \Rightarrow Span, Mkr \Rightarrow Reference, Mkr \Rightarrow Delay, and trace statistics (avg value, standard deviation, and peak to peak deviation of the data trace).

Source Control

Sweep Limits:

Set Start/Stop or Center/Span of the stimulus parameter (frequency, power, time) directly through the source control keys and the control knob, the step keys or the data entry keyboard.

Sweep Type:

Set a linear or logarithmic sweep, an arbitrarily defined frequency list, a Power Sweep or a CW (single frequency) type of sweep.

Measured # points per Sweep:

Linear frequency: range between 3 and 1601 points.

Arbitrary Frequency List:

Define up to 30 different sub-sweep frequency ranges in any combination of CW, CW-delta F, or Start-Stop sweep modes.

Sweep Modes:

Set a coupled display channel sweep or an uncoupled display channel sweep (alternate sweep)

Sweep Time:

Set sweep time in second, minutes or hours. Minimum sweep time is dependent on number of data points per sweep and the IF bandwidth.

Sweep Trigger:

Set to either Continual, Hold, Single, Group Sweep, or External trigger.

Source Power:

Set source power (+ 20 to -5 dBm) or power slope (dBm/GHz). With the s-parameter test set sets, can control incident port signal by setting the internal attenuator of the test set.

Data Accuracy Enhancement

Calibration Sets Available:

Frequency Response:

Simultaneous magnitude and phase correction of frequency response errors for either reflection or transmission measurements. Requires a short or open circuit termination (reflection) or a through connection (transmission).

One Port Cal:

Correction of test set Port 1 or Port 2 directivity, frequency response and source match errors. Requires open, short, and load terminations.

Two Port Cal⁶:

Compensates for directivity, source match, reflection frequency response, load match, transmission frequency response and crosstalk for an S parameter test set. Crosstalk calibration can be eliminated. Requires open, short, and load terminations plus a through connection.

One Port Two Path Cal⁶:

A two port cal for the one port Reflection/Transmission test sets. Provides a full two port error corrected measurement when the test device is turned around and measured in both directions.

⁵Time Domain (the Fourier Transformation of Frequency Domain data) is available only with Option 010.

⁶Volatile memory is limited to 128 kBytes maximum. This excludes 801 and 1601 point full two port calibrations.

Reference Plane Extension:

Redefine the plane of measurement reference to other than Port 1 or Port 2 of the test set. A new reference plane is defined in seconds of delay from the test set port and ranges between ± 1 seconds.

Select Default Calibration Kit:

Select either standard (7 mm, 3.5 mm, type N 50 ohm, and type N 75 ohm) calibration kits or define the standards (e.g., open circuit capacitance coefficients, offset short length, or fixed loads)

Data Averaging:**IF Bandwidth:**

The IF bandwidth is selectable from 3 kHz to 10 Hz bandwidth to reduce the effective displayed noise floor of the instrument.

Weighted Sweep-to-Sweep Averaging:

Averages vector data on each successive sweep. $A(n) = S(n)/F + (1-1/F)*A(N-1)$ where $A(n)$ is the current average, $S(n)$ is the current input signal, and F is the averaging factor. Averaging factors range from 1 to 512.

Trace Smoothing:

Similar to video filtering, this function computes the moving average of adjacent data points. Advantageous in reducing relatively small peak-to-peak noise values on relatively large broadband measured data. Smoothing aperture defines the trace width (number of points) to be averaged, and ranges from 0.25% to 20% of the trace width. This function also sets the aperture for group delay measurements.

Display Control

CRT Formats

Single channel, dual channel overlay (both traces on one graticule), dual channel split (each trace on separate graticules).

Trace Functions:

Display Data: Display current measurement data, memory data, or current measurement and memory data simultaneously.

Trace Math: Vector division or subtraction of current linear measurement values and memory data.

Display Annotations:

Start/stop, center/span, or CW frequency, source level, scale/div, reference level, marker data, soft key functions, warning and caution messages, trace identification and pass/fail indication.

Reference Position:

Ranges from the 0 (bottom) to 10 (top) graticule position.

Autoscale:

Automatically selects Scale Resolution and Reference Value to center the trace on the CRT graticules for easy viewing.

Electrical Delay:

Offset measured phase or group delay by a defined amount of electrical delay, in seconds. Operates similarly to an electronic line stretcher. Amount of electrical delay can range between ± 1 seconds.

Frequency Blanking:

Blank all frequency information on the display. Requires an instrument preset to re-enable frequency information on the display.

Title:

Add custom titles (49 characters maximum) to the display of the HP 8753A. Titles will be plotted when making hardcopies of displayed measurements.

Intensity/Focus:

Control the intensity and focus values of the CRT. Control is in % of full range.

Instrument Control

Control Knob, Step Keys, and Data Entry Keyboard:

Instrument parameters may be set in one or all of three ways. The control knob allows for continuous adjustment of a parameter, while the data entry keyboard is used to enter an exact function value. The step keys can be used to increment or decrement parameter values.

Menu and Softkey keyboards:

Instrument measurement functions may be accessed through menu keys which select a given set of functions to appear on the softkey keyboard. Selection of the appropriate softkey then selects the desired instrument function.

Storage⁷

Instrument State:

Five instrument states can be stored via the SAVE menu. Instrument states can then be recalled via the RECALL menu. Instrument states include all control settings, active limit lines, active list frequency tables, memory trace data, active calibration coefficients, and custom display titles. Storage is in volatile and non-volatile memory.

⁷Volatile memory is limited to 128 kBytes total. This will limit operation and storage of calibration and transform data (Time Domain Option 010) for large measurement arrays (e.g., 401, 801, 1601 point measurements).

Supplemental Characteristics (Cont'd.)

(See definition of specifications and supplemental characteristics on page 14)

Data Hardcopy

Data Plotting:

Hard copy plots are automatically produced by the HP 8753A when used with an HP-GL compatible digital plotter such as the HP 7440 and compatible graphics printers such as the HP 2225A Thinkjet printer.

Data Listings:

Printouts of instrument data are directly produced by the HP 8753A when used with a compatible HP-IB printer such as the HP 2225A Thinkjet printer.

Configure Plots:

Configure plots completely from the HP 8753A by defining pen color and line type for data, text, markers, graticules, and memory traces.

Functions:

Plot Trace(s), Graticule(s), Marker(s), or Text including operating and system parameters.

Quadrants:

Plot entire display in one of four different quadrants of the plotter paper.

System Capabilities:

Limit Lines:

Define test limit lines that appear on the CRT display for go/no go testing. Lines may be any combination of horizontal or sloping lines, or discrete data points.

Operating Parameters:

Displays current instrument operating parameters.

Transform:

When Time Domain Option 010 is present, selects the Time Domain transform menu.

Service Menu:

Select the desired service test, service diagnostic, service or verification mode.

Time Domain (option 010):

Description

With Time Domain option, data from transmission or reflection measurements in the frequency domain is converted to the time domain using a Fourier transformation technique (Chirp Z) and presented on the CRT display.

Conversion Speed (Exclusive of the time to measure data in the Frequency Domain)

Data points/sweep	Conversion time (typical)
201	750 msec
401	750 msec
801	1500 msec
1601	3000 msec

Time Stimulus Modes

Standard Stimulus: Two types of time excitation stimulus waveforms can be simulated during the transformation—a step and an impulse.

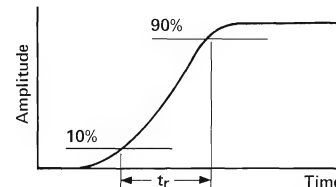
External Stimulus: The definition of other time excitation stimulus waveforms can be accomplished using an external controller.

Low Pass Step: This stimulus, similar to a traditional Time Domain Reflectometer (TDR) stimulus waveform, is used to measure low pass devices. The Frequency Domain data should extend from DC (extrapolated value) to a higher value, the upper limit being defined by the test set used. The Time Domain response shows the parameter value versus time (multiply by C to obtain electrical length or by C and Vrel to obtain physical length). The step response is typically used for reflection measurements only.

Step Rise Time (t_r) (10% to 90%): This depends on both the frequency span and the window used (see Windowing):

$t_r = 0.45/(\text{Frequency span}) \times$	1.0	minimum window
	2.2	normal window
	3.3	maximum window

Examples: For a frequency span of 3 GHz, the fastest rise time achievable is 150 ps (4.5 cm). This increases to 225 ps (6.75 cm) when the frequency span is reduced to 2 GHz.



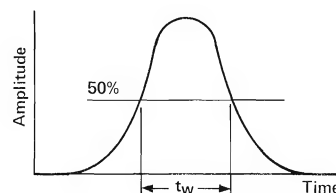
Low Pass Impulse: This stimulus is also used to measure low pass devices. The Frequency Domain data should extend from DC (extrapolated value) to a higher value, the maximum frequency determined by the test set. The Time Domain response shows changes in the parameter value versus time. The impulse response can be used for reflection or transmission measurements.

Low Pass Impulse Width (t_w): This depends on both the frequency span and the window used:

$t_w = 0.6/(\text{Frequency span}) \times$	1.0	minimum window
	1.6	normal window
	2.4	maximum window

Examples: for a frequency span of 3 GHz, the fastest low pass impulse width achievable is 200 ps (6 cm). This increases to 300 ps when the frequency span is decreased to 2 GHz.

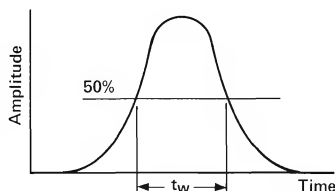
Bandpass Impulse: The Bandpass Impulse simulates a pulsed RF signal (with an impulse envelope) and is used to measure the Time Domain response of band-limited devices. The Start and Stop frequencies are selectable by the user to any values within the limits of the test set used. The Bandpass Time Domain response also shows changes in the parameter values versus time. Bandpass Time Domain responses are useful for both reflection and transmission measurements.



Bandpass Impulse Width (t_w): This depends on both the frequency span and the window used:

$$t_w = 1.2/(\text{Frequency span}) \times \begin{matrix} 1.0 & \text{minimum window} \\ 1.6 & \text{normal window} \\ 2.4 & \text{maximum window} \end{matrix}$$

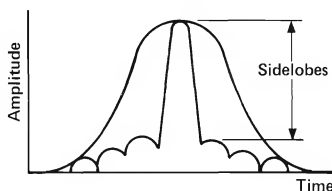
Examples: for a frequency span of 3 GHz, the fastest Bandpass Impulse width achievable is 400 ps (12 cm). This increases to 600 ps with a decrease in frequency span to 2 GHz.



Windows

The windowing function can be used to modify (filter) the Frequency Domain data and thereby reduce overshoot and ringing in the Time Domain response. Three types of Windows are available—Minimum, Normal, and Maximum. Typical Impulse width and sidelobe response for each window are shown in the table below.

Window	Impulse Width	Sidelobes (rel to pk)	Step Rise Time	Step Sidelobes
Minimum	Minimum	-13 dB	Minimum	-21 dB
Normal	1.6 x Minimum	-44 dB	2.2 x Minimum	-60 dB
Maximum	2.4 x Minimum	-90 dB	3.3 x Minimum	-90 dB



Gating

The gating function can be used to selectively remove reflection or transmission Time Domain responses in time. In converting back to the frequency domain the effects of the responses outside the gate are removed. The location and span of the gate can be controlled by setting either the center position and time span of the gate or by setting the start and stop time of the gate.

Time Domain Range (free of response repetition)

The Time Domain Range, over which the display is free of response repetition is given, in nanoseconds, by:

$$\text{Range} = 1/\Delta F = \frac{(\text{Number of points in Frequency Domain} - 1)}{\text{Frequency Span (GHz)}}$$

Resolution

There are two different terms associated with resolution in the Time Domain: Range-Resolution and Response-Resolution.

Range-Resolution is the ability to locate a single response in time (that is, how closely in time can that response be located). It is a function of the Time span selected and the number of data points.

$$\text{Range-Resolution} = \text{Time Span}/(\text{number of points} - 1)$$

Response-Resolution is the ability to resolve two closely spaced responses that are of equal magnitude and is therefore a function of impulse width (or step rise time). In general, two responses of equal magnitude that are separated in time by less than one impulse width cannot be resolved as two separate responses (refer to the formulas given for Step rise time and Lowpass and Bandpass impulse width).

Remote Programming

Interface:

HP-IB interface operates according to IEEE 488-1978 and IEC 625 standards and IEEE 728-1982 recommended practices.

Addressing:

The HP-IB address of the HP 8753A can be verified or set from the front panel via the Local menu and can range from 0 to 30 decimal (factory set at 16).

Pass Control:

Allows the HP 8753A to request control of the HP-IB (when an active controller is present) whenever it needs to output to a plotter or printer.

System Controller:

Lets the HP 8753A become a controller on the HP-IB to directly control a plotter or a printer.

Talker/Listener:

Lets the HP 8753A become a HP-IB talker/listener when an external controller is present.

Transfer Formats:

Binary (internal 48 bit floating point complex format)

ASCII

32/64 bit IEEE 754 Floating Point Format

Transfer Speed:

Binary (201 pt. trace): 180 msec, typical

ASCII (201 pt. trace): 1 sec, typical

32-bit IEEE 754: 320 msec, typical

single point: 5 msec, typical

User-accessible Graphics:

Using a subset of HP Graphics Language (HP-GL), vector or text graphics may be written on the HP 8753A CRT via HP-IB. Up to 64 kbytes⁸ of data can be stored at one time (4 bytes per vector, 2 bytes per character).

Interface Function Codes:

SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, C1, C10, E2

⁸Graphics memory is part of the instrument's volatile memory. Extensive use of memory for graphics reduces the available memory for normal instrument operation.

Supplemental Characteristics (Cont'd.)

(See definition of specifications and supplemental characteristics on page 14)

General Characteristics

Measurement Throughput Summary:

Typical Measurement Speed (msec)⁹:

IF BW		# of Points			
		1	201	401	1601
3 kHz	.8	161	321	321	1280
800 Hz	2.3	462	922	922	3680
10 Hz	105	21000	42000	42000	173000

Typical Programming Speed⁹(msec):

(201 points, 3 kHz BW)

setup	trig	meas	output	total
30	10	161	180	381 msec

External Reference Frequency Input:

Frequency: 1, 2, 5, and 10 MHz (± 200 Hz @ 10 MHz)

Level: -10 dBm to +20 dBm, typical

Impedance: 50 ohms

External Trigger:

Triggers on a negative TTL transition or contact closure to ground.

External AM Auxiliary Input:

± 1 volt into a 5 kohm resistor; 1kHz max.

Operating Conditions:

Temperature: 0 to 55°C

Non-Operating Conditions:

Temperature: -40 to +75°C

Power:

47.5 to 66 Hz: 115V +10%, -25%, 230V +10%, -15%, 220 VA max

Weight:

Net, 22 kg (48 lb); Shipping, 25 kg (55lb)

Dimensions:

178 H x 425 W x 482 mm D

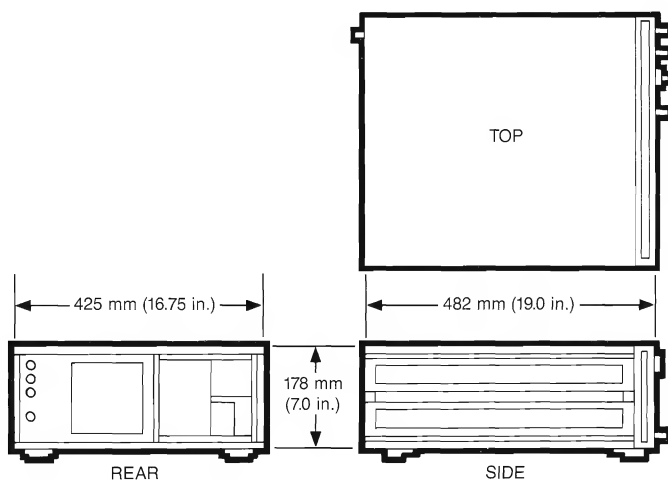
(7.0 x 16.75 x 19.0 in)

Add 1.0 inches to depth to include the front panel connectors.

Ordering Information

HP 8753A network analyzer

opt 010	Time Domain
opt 908	Rack Mount Kit (without handles)
opt 910	Extra Operating Manual
opt 913	Rack Mount Kit
opt W03	On-site Warranty Conversion
opt W30	3 Year Extended Return-to-HP Support
08753-60050	Module level repair kit
08753-60051	Module level repair kit
85019A	Time Domain retrofit kit
	—Retrofit kit provides Time Domain (Option 010) capability if Option 010 is not specified when the HP 8753A is purchased.



⁹Measurement speed indicated is for a one-port calibrated measurement and does not include source band switch times (15 msec typical).

HP 8753A Accessories

HP 85044A/B Transmission/Reflection Test Sets

The HP 85044 A/B Transmission/Reflection test sets provide the capability to simultaneously measure the impedance and transmission characteristics of 50 and 75 ohm devices. Two port devices must be physically turned around to measure their reverse direction characteristics. Test port connectors are precision 7 mm and 75 ohm type N (f) respectively.

Specifications	HP 85044A	HP 85044B
Impedance:	50 ohm	75 ohm
Frequency Range:	300 kHz–3 GHz	300 kHz–2 GHz
Directivity:	35 dB to 1.3 GHz 30 dB to 3.0 GHz	35 dB to 1.3 GHz 30 dB to 2.0 GHz

Typical Tracking:

Transmission Magnitude, Phase¹⁰:

.3 MHz to 2.0 MHz	± 1.0 dB, $\pm 10^\circ$	± 1.0 dB, $\pm 10^\circ$
2.0 MHz to F_{\max}^{11}	± 1.0 dB, $\pm 5^\circ$	± 1.0 dB, $\pm 5^\circ$

Reflection Magnitude, Phase¹⁰:

.3 MHz to 2.0 MHz	± 1.0 dB, $\pm 25^\circ$	± 1.0 dB, $\pm 25^\circ$
2.0 MHz to F_{\max}	± 1.0 dB, $\pm 5^\circ$	± 1.0 dB, $\pm 5^\circ$

Effective Source Match:

Test Port:

.3 MHz to 2.0 MHz	15 dB	15 dB
2.0 MHz to 1.3 GHz	20 dB	17 dB
1.3 GHz to F_{\max}	16 dB	16 dB

Port Match:

Incident and Refl:

.3 MHz to 1.3 GHz	18 dB	18 dB
1.3 GHz to F_{\max}	13 dB	13 dB

RF Input:

.3 MHz to 1.3 GHz	17 dB	17 dB
1.3 GHz to F_{\max}	12 dB	12 dB

Nominal Insertion Loss:

Input to Test Port:	12.5 dB + .5 dB/GHz	22 dB + 1 dB/GHz
Input to Incident:	18 dB + 1.5 dB/GHz	18 dB + 1 dB/GHz
Input to Refl:	19 dB + 1.5 dB/GHz	30 dB + 1.5 dB/GHz

Max Operating Level:

	+ 20 dBm	+ 20 dBm
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Damage Level:

	+ 30 dBm (1 watt)	+ 30 dBm
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RF attenuator range:

	0 to 70 dB (10 dB steps)	70 dB (10 dB steps)
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DC Bias range:

	+ 30 VDC, ± 200 mA, some degradation of RF specs; ± 500 mA max	
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DC Bias Connectors:

	50 ohm BNC (f)	50 ohm BNC (f)
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RF Connectors:

Test Port:	precision 7 mm	75 ohm type N (f)
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Includes:

	HP 85044A—one precision 7 mm to 50 ohm type N (f) adapter;	
	HP 85044B—one HP 11852B minimum loss pad.	

Recommended Accessories:

	HP 11851B RF cable kit	
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Dimensions:

	615H x 101W x 204 mmD	
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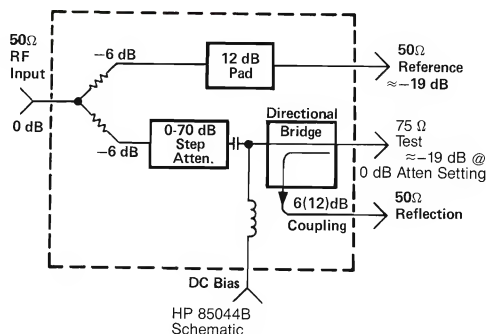
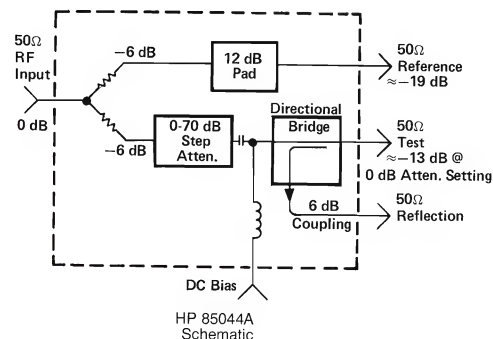
Weight:

	(2.44 x 7.5 x 8.0 in)	
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Ordering Information:

	net 1.7 kg (3.8 lb)	
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HP 85044A 50 ohm T/R test set
HP 85044B 75 ohm T/R test set
Option 910 Extra Manual
Option W30 3 Year Extended Return-to-HP Support



¹⁰Degrees, specified as deviation from linear phase.

¹¹ F_{\max} is the upper frequency limit of the associated test set.

HP 8753 Accessories (Cont'd.)

(See definition of specifications and supplemental characteristics on page 14)



HP 85046 A/B S-Parameter Test Set

The HP 85046 A/B s-parameter test sets provide the capability to measure impedance and transmission characteristics (including s-parameters) of 2 port devices in either direction with a single connection. The test sets are controlled from the HP 8753A and include a programmable step attenuator. Test port connectors are precision 7 mm and 75 ohm type N (f) respectively. Both connectors can be adapted to other interfaces with the appropriate precision adapters.

Specifications

	HP 85046A	HP 85046B
Impedance:	50 ohms	75 ohms
Frequency Range:	300 kHz to 3 GHz	300 kHz to 2 GHz
Directivity:	35 dB to 1.3 GHz 30 dB to 3.0 GHz	35 dB to 1.3 GHz 30 dB to 2.0 GHz

Typical Tracking:

Transmission Magnitude, Phase¹²:

.3 MHz to 2.0 MHz	± 1.0 dB, $\pm 25^\circ$	± 1.0 dB, $\pm 25^\circ$
2.0 MHz to F_{\max} ¹³	± 1.0 dB, $\pm 5^\circ$	± 1.0 dB, $\pm 5^\circ$

Reflection Magnitude, Phase¹²:

.3 MHz to 2.0 MHz	± 1.0 dB, $\pm 25^\circ$	± 1.0 dB, $\pm 25^\circ$
2.0 MHz to F_{\max}	± 1.0 dB, $\pm 5^\circ$	± 1.0 dB, $\pm 5^\circ$

Effective Source Match:

(Test Ports):

.3 MHz to 2.0 MHz	15 dB	15 dB
2.0 MHz to 1.3 GHz	20 dB	17 dB
1.3 GHz to F_{\max}	16 dB	16 dB

Port Match:

R, A, B:

.3 MHz to 1.3 GHz	18 dB	18 dB
1.3 GHz to F_{\max}	13 dB	13 dB

RF Input:

.3 MHz to 1.3 GHz	17 dB	17 dB
1.3 GHz to F_{\max}	12 dB	12 dB

Nominal Insertion Loss:

Input to Port 1, 2:	12.5 dB + .5 dB/GHz	22 dB + 1 dB/GHz
Input to R:	18 dB + 1.5 dB/GHz	18 dB + 1 dB/GHz
Input to A, B:	19 dB + 1.5 dB/GHz	30 dB + 1.5 dB/GHz

Typical Isolation

between Port 1 and 2:	100 dB	100 dB
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Test Set Switch

Repeatability¹⁴:	$\pm .03$ dB	$\pm .03$ dB
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Max Operating Level:	+20 dBm	+20 dBm
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Damage Level:	+30 dBm (1 watt)	+30 dBm
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RF Attenuator Range:	70 dB (10 dB steps)	70 dB (10 dB steps)
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DC Bias Range:	30 VDC, ± 200 mA, some degradation of RF specs; ± 500 mA max	
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RF Connectors:

Port 1, 2:	precision 7 mm	75 ohm type N (f)
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All others:	50 ohm type N (f)	50 ohm type N (f)
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Includes: Four 190 mm (7.5") cables with type N (m) connectors for connection to the HP 8753A.
one HP 8753A test set interconnect cable

Recommended

Accessories:

Dimensions:

Weight:

Ordering Information:

HP 11857D cables HP 11857B cables

90 H x 426 W x 553 mm D

(3.5 x 16.75 x 21.5 in.)

9.1 kg (20 lb)

HP 85046A S-Parameter test set

HP 85046B 75 ohm S-Parameter test set

Option 908 Rack Mount Kit

(for instruments without handles)

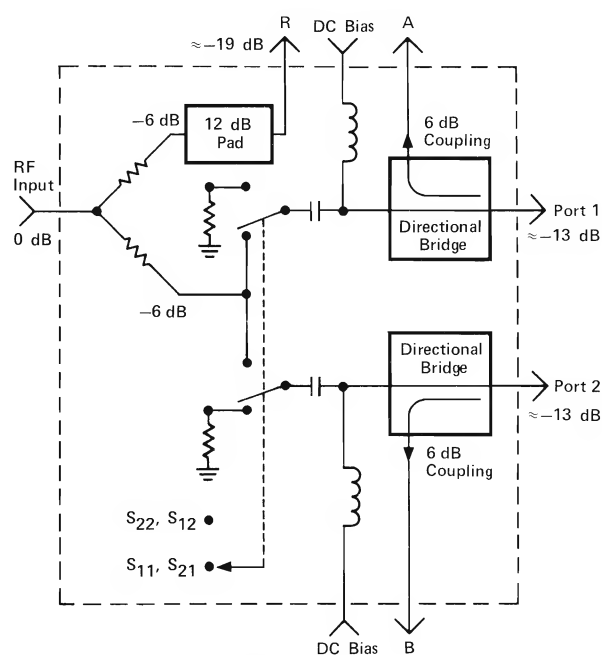
Option 910 Extra Manual

Option 913 Rack Mount Kit

(for instruments with handles)

Option W03 On-site Warranty Conversion
for HP 85046A only.

Option W30 3 year Extended Return-to-HP
Support



HP 85046A Schematic

¹²Degrees, specified as deviation from linear phase.

¹³ F_{\max} is the upper frequency limit of the associated test set.

¹⁴Test set switch lifetime is approximately 1 million cycles.

Calibration Kits

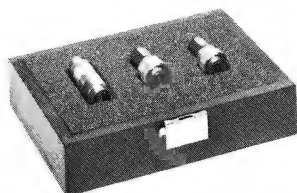
Vector accuracy enhancement procedures require that the systematic errors of the measurement system be characterized by measuring known devices (standards) on the system over the frequency range of interest. The following calibration kits contain precision standards in many different connector types.

HP 85031B 7 mm Calibration Kit

Contains precision 7 mm standards used to calibrate the HP 8753A with its test set for measurement of devices with precision 7 mm connectors.

Includes:

7 mm 50 ohm termination (2 ea)	52 dB RL	HP 85031-60002
7 mm short/open calibrator		HP 85031-60001

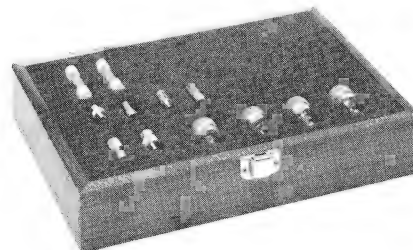


HP 85033C 3.5 mm Calibration Kit

Contains a set of precision 3.5 mm standards to calibrate the HP 8753A with its 50 ohm test sets for the measurement of devices with precision 3.5 mm and SMA connectors. Precision phase-matched 7 mm to 3.5 mm adapters are included for accurate measurements of non-insertable devices.

Includes:

3.5 mm male 50 ohm termination	35 dB RL @ 3 GHz	HP 85033-60004
3.5 mm female 50 ohm termination	35 dB RL @ 2 GHz	HP 85033-60005
3.5 mm female short		HP 1250-1769
3.5 mm male short		HP 1250-1768
3.5 mm female open w/ext		HP 1250-1767
3.5 mm male open w/ext		HP 1250-1766
7 mm to 3.5 mm male adapter (2 ea)		HP 1250-1746
7 mm to 3.5 mm female adapter (2 ea)		HP 1250-1747

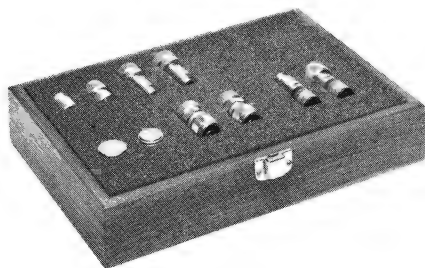


HP 85032B 50 ohm type N Calibration Kit

Contains precision 50 ohm type N standards used to calibrate the HP 8753A and its 50 ohm test sets for measurement of devices with 50 ohm type N connectors. Precision phase-matched 7 mm to type N adapters are included for accurate measurements of non-insertable devices.

Includes:

N-male 50 ohm termination	45 dB RL @ 3 GHz	HP 85032-60004
N-female 50 ohm termination	45 dB RL @ 3 GHz	HP 85032-60005
N-male Short Circuit		HP 11512A
N-female Short Circuit		HP 11511A
N-female Open Circuit (body)		HP 85032-20001
N-female Open Circuit (cond)		HP 85054-60008
N-male Open Circuit		HP 85054-60007
7 mm to N-male adapter (2 ea)		HP 11525A
7 mm to N-female adapter (2 ea)		HP 85054-60001

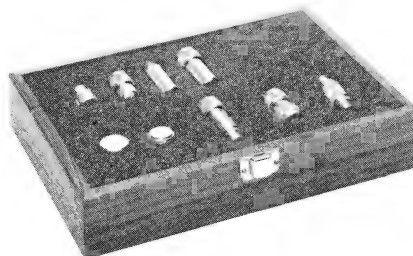


HP 85036B 75 ohm type N Calibration Kit

Contains a set of precision 75 ohm type N standards to calibrate the HP 8753A with its 75 ohm test sets for measurements of devices with 75 ohm type N connectors. Precision phased matched adapters are included for accurate measurements of non-insertable devices.

Includes:

N-male 75 ohm termination	45 dB RL @ 2 GHz	HP 85036-60008
N-female 75 ohm termination	45 dB RL @ 2 GHz	HP 85036-60009
N-female 75 ohm short		HP 85036-60011
N-male 75 ohm short		HP 85036-60012
N-female open (body)		HP 85032-20001
N-male open		HP 85054-60007
N-male to N-male 75 ohm adapter		HP 85036-60013
N-female to N-female 75 ohm adapter		HP 85036-60014
N-male to N-female 75 ohm adapter		HP 85036-60015



HP 8753 Accessories (Cont'd.)

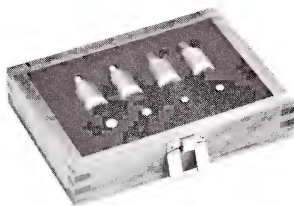
(See definition of specifications and supplemental characteristics on page 14)

HP 85033A SMA Calibration Kit

Contains a set of typical standards to calibrate the HP 8753A with its test sets when measuring devices with SMA connectors. These are not precision standards and should not be used as error correction standards. Those applications which require the highest levels of accuracy should utilize an HP 85033C 3.5 mm calibration kit.

Includes:

SMA male 50 ohm termination	HP 0960-0053
SMA female 50 ohm termination	HP 0960-0050
SMA male short	HP 0960-0055
SMA female short	HP 0960-0054
7mm to SMA female adapters (2 ea)	HP 1250-1468
7mm to SMA male adapters (2 ea)	HP 1250-1467

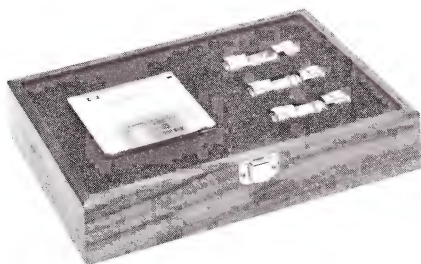


Verification Kits

Measuring known devices other than the standards used in calibration is an easy way to verify the proper operation of an HP 8753A measurement system. HP offers verification kits which includes devices, with data, for verifying the error-corrected measurements of an HP 8753A with its 50 ohm test sets.

HP 85029A 7 mm Verification Kit

Contains a set of precision 7 mm devices, with data traceable to NBS used to compare the calibrated performance of an HP 8753A measurement system. The HP 85031B 7 mm Calibration Kit and an external HP-IB 3.5 inch disc drive (connected to the HP 8753A) are required for complete verification.



Test Port Return Cables

Hewlett Packard offers high quality RF cables used to connect the HP 8753A to its test sets and to devices under test. These cables offer excellent RF shielding for high dynamic range measurements.

HP 11851B 50 ohm type N RF Cable Kit

Contains the necessary 50 ohm type N cables to connect the HP 8753A to the HP 85044 A/B transmission/reflection test sets including an RF cable to return the transmitted signal of a two port device to the HP 8753A. It is also recommended for use with the HP 11850 C/D three way power splitters. Kit includes three phase matched 610 mm (24") cables and one 860 mm (34") cable.

Return Loss: > 24 dB to 3 GHz;

Phase Tracking: $\pm 4^\circ$ @ 1.3 GHz

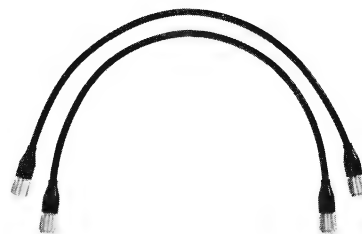


HP 11857B 75 ohm type N Test Port Return Cables

A pair of 610 mm (24") test port return cables for use with the HP 85046B 75 ohm s-parameter test set.

Return Loss: > 24 dB to 2 GHz;

Phase Tracking: $\pm 2^\circ$ @ 1.3 GHz

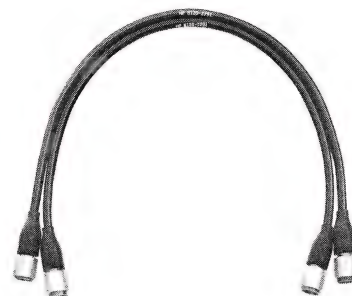


HP 11857D 7 mm Test Port Return Cables

A pair of 610 mm (24") test port return cables for use with the HP 85046A s-parameter test set. These cables can be used with connector types other than 7 mm with the appropriate precision adapters.

Return Loss: > 24 dB to 3 GHz

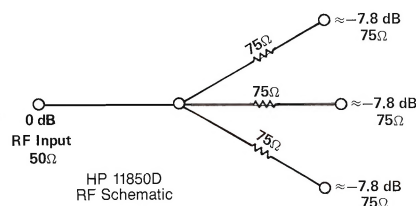
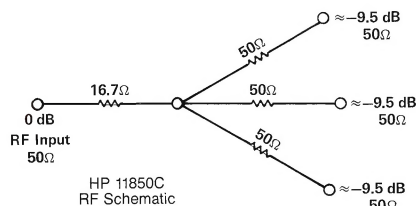
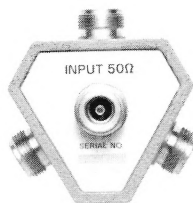
Phase Tracking: $\pm 2^\circ$ @ 1.3 GHz



HP 11850 C/D Three Way Power Splitters

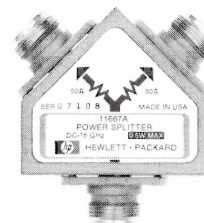
	HP 11850C	HP 11850D
Impedance:	50 ohms	75 ohms
Frequency Range:	DC to 3 GHz	DC to 2 GHz
Tracking:	$\pm .25$ dB, $\pm 3^\circ$	$\pm .2$ dB, $\pm 2.5^\circ$
Equivalent Source Match: (ratio or leveling)	30 dB @ 1.3 GHz 20 dB @ 3 GHz	30 dB @ 1.3 GHz 20 dB @ 2 GHz
Nominal Insertion Loss:	9.5 dB + 1 dB/GHz	7.8 dB
Input Port Match:		
DC to 1.3 GHz	20 dB	20 dB
1.3 GHz to F_{max}^{15}	10 dB	10 dB
Maximum Operating Level:	+ 20 dBm	+ 20 dBm
Damage Level:	+ 30 dBm	+ 30 dBm
RF Connectors:		
RF Input:	50 ohm type N (f)	50 ohm type N (f)
All Others:	50 ohm type N (f)	75 ohm type N (f)
Includes:		3 ea HP 11852B 50 to 75 ohm min. loss pads

Recommended Accessories: HP 11851B RF Cable Kit



HP 11667A 50 ohm Power Splitter:

Frequency Range:	DC to 18 GHz
Typical Insertion Loss:	6 dB
Equivalent Source Match:	26 dB to 4 GHz 21 dB to 8 GHz 17 dB to 18 GHz
Tracking: (between output arms)	$\pm .15$ dB to 4 GHz $\pm .2$ dB to 8 GHz $\pm .25$ dB to 18 GHz
Maximum Operating Level:	+ 27 dBm
Connectors:	50 ohm type N (f)
opt 001:	type N (m) on RF input type N (f) on outputs
opt 002:	type N (f) on RF input precision 7 mm on outputs
Dimensions:	46 H x 52 W x 19 mmD (1.8 x 2.0 x 0.7 in)
Recommended Accessories:	HP 11851B RF Cable Kit



HP 11852B 50 to 75 ohm Minimum Loss Pad:

Frequency Range:	DC to 2.0 GHz
Nominal Insertion Loss:	5.7 dB
Return Loss:	26 dB (50 ohm), 30 dB (75 ohm)
Maximum Input Power:	250 mw (+ 24 dBm)
Connectors:	50 ohm type N female to 75 ohm type N male
Dimensions:	14 D x 70 mm L (0.56 x 2.75 in.)
Weight:	Net, 0.1 kg (0.316 lb)



¹⁵ F_{max} is the upper frequency limit of the associated power splitter.

Service and Support Products

Service and support products are available for HP 8753A measurement systems. These on-site support products require a specific 50 ohm two-port measurement configuration!¹⁶ Additional on-site support products and return-to-HP support products are available for this and other system configurations. Contact your local HP sales office for availability and price.

HP 8753A System On-site Service

+ 23N Support Product

On Site Installation and System Verification

Have your HP 8753A system!¹⁶ installed and certified NBS traceable by a qualified HP Customer Engineer at your location.

+ 02B Support Product

On-site Service and System Verification

A qualified HP Customer Engineer will provide next day on-site response service for your HP 8753A system!¹⁶ Two PM's and two system verifications (certified NBS traceable) are included. Option W03 for each product in the system!¹⁶ must be specified for this service.

+ 23G Support Product

On-site System Verification

A qualified HP Customer Engineer will verify your HP 8753A system!¹⁶ operation and will provide you with a "Certificate of Traceability" with data traceable to NBS.

Option W03 On-site Warranty

Converts the standard one year return-to-HP warranty of the system!¹⁶ component to 90 days of on-site warranty. On-site service is available only on the specific 50 ohm two-port measurement system!¹⁶ thus to convert warranty, each system component must be ordered with Option W03.

HP 8753A Return-to-HP Service

HP 8753A Option W30 3 year extended return-to-HP support

Adds 2 additional years of return-to-HP support to your normal one year return-to-HP warranty for the HP 8753A network analyzer (does not include test sets, cables, or calibration kits). Return-to-HP support does not include annual maintenance or calibrations of the network analyzer.

Module Level Repair Kits

08753-60050 HP 8753A Full Service Kit

Contains one each of all major replaceable assemblies for the HP 8753A and the HP 85046A/85044A test sets to provide parts required for 95% of all repairs.

08753-60051 HP 8753A Economy Service Kit

Contains one each of selected major assemblies for the HP 8753A and the HP 85046A/85044A test sets to provide parts for 60% of all repairs.

¹⁶The specific 50 ohm two-port measurement system includes the HP 8753A, the HP 85046A S-parameter test set, the HP 85031B 7mm calibration kit, and the HP 11857D 7mm test port extension cable set. This is a minimum configuration required for on-site system verification.

Selection Guide

	50 ohm			75 ohm		
	Transmission	Transmission/ Reflection	S-Parameter	Transmission	Transmission/ Reflection	S-Parameter
Network Analyzer	HP 8753A	HP 8753A	HP 8753A	HP 8753A	HP 8753A	HP 8753A
Test Set		HP 85044A	HP 85046A		HP 85044B	HP 85046B
Power Splitter	HP 11850C			HP 11850D		
Test Cables	HP 11851B	HP 11851B	HP 11857D	HP 11851B	HP 11851B	HP 11857B
Cal Kits 7mm		HP 85031B	HP 85031B			
type N		HP 85032B	HP 85032B		HP 85036B	HP 85036B
3.5 mm		HP 85033C	HP 85033C			
Verification Kit		HP 85029A	HP 85029A			
Accessory Kit						
type N	HP 11853A	HP 11853A	HP 11853A	HP 11855A	HP 11855A	HP 11855A
BNC	HP 11854A	HP 11854A	HP 11854A	HP 11856A	HP 11856A	HP 11856A
Transistor Test						
Fixtures						
TO-18/TO-72			HP 11600B			
TO-5/TO-12			HP 11602B			
Fixture Adapter			HP 11858A			

Principal Element Price Summary

Network Analyzer

HP 8753A Network Analyzer
Option 010 Time Domain

Test Sets

HP 85044A 50 ohm Transmission/Reflection Test Set
(300 kHz to 3 GHz)

HP 85046A 50 ohm S-Parameter Test Set
(300 kHz to 3 GHz)

HP 11850C 50 ohm Three-way Power Splitter
(300 kHz to 3 GHz)

For additional assistance in determining the appropriate combination of instruments to configure a complete measurement system, refer to the HP 8753A ORDERING GUIDE.

For more information, call your local HP sales office listed in the telephone directory white pages. Ask for the Electronic Instruments Department. Or write to Hewlett-Packard:

United States:

Hewlett-Packard
P.O. Box 10301
Palo Alto, CA 94303-0890

Canada:

Hewlett-Packard Ltd.
6877 Goreway Drive
Mississauga, Ontario L4V 1M8

Europe:

Hewlett-Packard S.A.
Uilenstede 475
P.O. Box 999
NL-1180 AZ Amstelveen
The Netherlands

Japan:

Yokogawa-Hewlett-Packard Ltd.
29-21 Takaido-Higashi, 3 Chome
Suginami-ku, Tokyo 168

Elsewhere in the world, write to:
Hewlett-Packard Intercontinental
3495 Deer Creek Road
Palo Alto, CA 94304



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